





defined by Georgia's National Statistics Office (GeoStat). Within each cluster, we conducted a systematic sample of 25 households. We divided the total number of households in the cluster by 25 and used a random starting point to begin sampling. Within each household, we applied the Kish method to randomly select one adult for participation [13].

We asked participants standardized questions from the Global Adult Tobacco Survey [14] and the WHO STEP-wise approach to Surveillance (STEPS) Survey (version 2.1) [15], which was the same version used in Georgia's 2010 STEPs survey. For survey questions concerning other chronic conditions like cancer, cardiovascular disease, and chronic respiratory disease, we developed questions from standard National Health and Nutritional Examination Survey (NHANES) wording [16]. In the analysis below, we report on results for four common NCD risk factors (current daily smoking, heavy episodic drinking, elevated blood pressure, obesity) and four major categories NCDs (chronic respiratory disease, cancer, diabetes, and cardiovascular disease).

We collected data on blood pressure and anthropometric measurements to estimate the proportion of adults that had elevated blood pressure or had obesity. Both measurements were carried out using standard equipment and the recommended WHO STEPS protocol [15]. We calculated BMI by dividing each participant'

Table 2 Demographic characteristics among Georgian adults, Georgia NCD survey, 2015

Demographic Characteristics	Unweighted sample size n	Population-weighted percentage % (95% CI)
Overall		
Age (years)		
18–29	1115	19.4 (18.1, 20.7)
30–44	1725	29.0 (27.3, 30.7)
45–59	1662	25.5 (24.0, 27.0)
60+	1790	26.1 (24.5, 27.7)
Missing	4	0.05 (< 0.01, 0.1)
Sex		
Males	3868	53.8 (52.0, 55.5)
Females	2428	46.2 (44.5, 48.0)
Missing	0	0
Residency		
Urban	3350	56.7 (52.7, 60.6)
Rural	2946	43.3 (39.4, 47.3)
Missing	0	0
Education		
Completed less than elementary/primary	31.2ol(30)pu	(39.4,

through secondary school or higher, and 19.5% were unemployed at the time of the survey. Approximately 60.8% reported an annual household income less than 12,000 Georgian Lari (\$6797 USD).

The majority of the individuals surveyed were vulnerable to morbidity from NCDs, with 72.3% (95% CI: 70.7, 73.8%) of adults reporting at least one of four NCD risk factors. Heightened risk existed among the 39.3% (95% CI: 37.3, 41.3%) of people reporting

at least two NCD risk factors, and the 12.2% (95% CI: 11.0, 13.4%) of people reporting at least three NCD risk factors (Table 3). The most prevalent risk factor was elevated blood pressure, which was estimated to impact 37.5% (95% CI: 35.8, 39.3%) of the population according to physical measurements conducted during the survey (Table 2). Additionally, an estimated 33.4% (95% CI: 31.8, 35.0%) of adults had obesity, 27.5% (95% CI: 25.7, 29.2%) reported heavy episodic



An analysis of the geographical variation in NCDs

## Discussion

The results of this nationally representative survey highlight the high burden of common NCDs and their major risk factors in Georgian adults. Compared to many of its European peers, Georgia has not yet been successful in limiting tobacco use, obesity, diabetes, or cardiovascular disease. While significant

estimated. In the 2010 STEPS survey, an individual was la-



